AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An article comprising:

a metal substrate, having a substrate surface comprising at least one metal oxide selected from the group consisting of alumina and rare earth metal oxides;

a catalyst comprising at least one catalyst layer having an outer catalyst layer surface, the catalyst layer supported on the substrate surface; the catalyst comprising at least one catalytically active particulate material and the outer catalyst layer surface comprises agglomerates of the catalytically active particulate material having an average diameter of from about 20 to about 200 micrometers, and wherein the agglomerates at the outer catalyst layer surface adhere to each other to form peaks from about 20 to about 500 micrometers formed by depositing of at least two strata of the catalytically active particulate material with each strata being up to 20 micrometers in thickness.

2. (Original) The article as recited in claim 1 wherein the catalytically active material comprises at least one precious metal component and at least one refractory component.

3. (Original) The article as recited in claim 2 wherein the catalyst comprises at least two refractory components including a first refractory component and a second refractory component wherein the average particle size of the second refractory oxide component is greater than the average particle size of the first component.

4. - 17. (Cancelled)

18. (Currently Amended) A method comprising the steps of:

depositing at least two strata of a catalyst on a substrate surface of a substrate to form a catalyst layer with each strata being up to 20 micrometers in thickness, the substrate surface comprising at least one metal oxide selected from the group consisting of alumina and rare earth metal oxides, and the catalyst comprising at least one catalytically active particulate material deposited to form agglomerates of the catalytically active particulate material having an average diameter of from about 20 to about 200 micrometers and wherein the agglomerates at the outer catalyst layer surface adhere to each other to form peaks from about 20 to about 500 micrometers.

19. (Original) The method as recited in claim 18 wherein the catalytically active material comprises

at least one precious metal component; and

at least one first refractory component.

20. (Original) The method as recited in claim 19 wherein the catalyst comprises at least two refractory components including a first refractory component and a second refractory component wherein the average particle size of the second refractory oxide component is greater than the average particle size of the first component.

21. (Original) The method as recited in claim 18 wherein the step of depositing at least two strata further comprises depositing an aqueous slurry of the catalyst to form each strata as a composition having an amount of fluid to be less than incipient wetness and repeating this step for each succeeding strata.

22. (Currently Amended) The method as recited in claim ~~21~~ 18 wherein the step of depositing each stratum comprises spraying the slurry.

23. (Currently Amended) The method as recited in claim ~~21~~ 18 further comprising the step of drying each stratum prior to depositing the succeeding stratum.

24. (Currently Amended) The method as recited in claim ~~21~~ 18 wherein each stratum of the layer comprises the same catalyst composition.

25. (Currently Amended) The method as recited in claim ~~21~~ 18 wherein the strata of the layer comprise different catalyst compositions.

26. (Original) The method as recited in claim 18 wherein there are at least two catalyst layers.

27. - 30. (Cancelled)

31. (Previously Presented) The method as recited in claim 18 further comprising the step of forming a tie layer comprising a refractory metal compound adjacent to the substrate surface and between the substrate surface and the catalyst.

32. - 36. (Cancelled)

37. (Previously Presented) The method as recited in claim 18 further comprising the step of roughening the substrate surface to form a rough substrate surface.

38. (Original) The method as recited in claim 37 further wherein the step of roughening the substrate surface comprises sandblasting the surface.

39. (Original) The method as recited in claim 37 further wherein the step of roughening the substrate surface comprises chemically treating the surface.

40. (Previously Presented) The method as recited in claim 18 wherein the substrate comprises a metal alloy containing alumina further comprising the step of calcining the rough substrate surface to form a layer comprising alumina on a substrate surface.

41. (Original) The method as recited in claim 40 wherein the step of calcining the substrate is conducted from about 800°C to about 1100°C for from 0.5 hours to about 10.0 hours.

42. (Previously Presented) The method as recited in claim 18 further comprising the step of calcining the at least one catalyst layer.

43. (Original) The method as recited in claim 42 further comprising the steps of forming and then calcining the at least one bottom layer followed by forming and then calcining the at least one top layer.

44. (Previously Presented) The method as recited in claim 18 further comprising the step of adding to the catalyst at least one of the following materials to selected from the group consisting of:

at least one rare earth metal component;
an oxygen storage composition;
at least one stabilizer; and
a compound containing zirconium.

45. (Currently Amended) A method comprising the steps of:

contacting a gas containing at least one component selected from the group consisting of nitrogen oxide, carbon monoxide and/or hydrocarbon with an article comprising:

a metal substrate, having a substrate surface comprising at least one metal oxide selected from the group consisting of alumina and a rare earth metal;

a catalyst comprising at least one catalyst layer having an outer catalyst layer surface, the catalyst layer supported on the substrate surface; the catalyst comprising at least one catalytically active particulate material and the outer catalyst layer surface comprises agglomerates of the catalytically active particulate material having an average diameter of from about 20 to about 200 micrometers, and wherein the agglomerates at the outer catalyst layer surface adhere to each other to form peaks from about 20 to about 500 micrometers formed by depositing of at least two strata of the catalytically active particulate material with each strata being up to 20 micrometers in thickness.

46. - 47. (Cancelled)

52. (Previously Presented) The article as recited in claim 2 wherein the refractory component is selected from the group consisting of silica, alumina and titania compounds.

Previously Presented Amended) The article as recited in claim 52 wherein refractory component is selected from the group consisting of alumina, silica, silica-alumina, alumina-silicates, alumina-zirconia, alumina-chromia, and alumina-ceria.

54. (Previously Presented) The article as recited in claim 53 wherein the refractory component is activated alumina.

55. (Previously Presented) The article as recited in claims 1 wherein the catalyst composition further comprises a nickel or iron component.

56. (Previously Presented) The article of claim 1 wherein the catalyst further comprises at least one component selected from the group consisting of:

at least one rare earth metal component;
an oxygen storage composition;
at least one first stabilizer; and
a compound containing zirconium.

57. (Previously Presented) The article as recited in claim 56 wherein at least one of said rare earth metal component is selected from the group consisting of lanthanum components and neodymium components.

58. (Previously Presented) The article as recited in claim 56 wherein the oxygen storage component is selected from the group consisting of cerium and praseodymium compounds.

59. (Previously Presented) The article as recited in claim 56 wherein the stabilizer is at least one alkaline earth metal component derived from a metal selected from the group consisting of magnesium, barium, calcium and strontium.

60. (Previously Presented) The article as recited in claim 56 further comprising a particulate composite of zirconia compound and rare earth oxide.

61. (Previously Presented) The article as recited in claim 60 wherein the rare earth oxide is ceria and, optionally, further comprises lanthana, neodymia and mixtures thereof.

62. (Previously Presented) The article metal substrate as recited in claim 1 wherein the metal substrate is in the form of a metal plate at least 0.005 inches thick.

63. (Previously Presented) The article as recited in claim 62 wherein the metal plate is at least 0.025 inches thick.

64. (Previously Presented) The article as recited in claim 62 wherein the metal plate is corrugated.

65. (Previously Presented) The article as recited in claim 62 wherein the metal plate contains a plurality of holes.

66. (Previously Presented) The article as recited in claim 1 wherein the metal substrate is in the form of at least part of an exhaust system wall defining an exhaust stream passage, wherein the exhaust system wall of exhaust stream passage defines the substrate surface.

67. (Previously Presented) The article metal substrate as recited in claim 1 wherein the metal substrate is in the form of a baffle plate of an exhaust system muffler.

68. (Previously Presented) The article as recited in claim 67 wherein the baffle plate is at least 0.025 inches thick.

69. (Previously Presented) The article as recited in claim 67 wherein the baffle plate is corrugated.

70. (Previously Presented) The article as recited in claim 67 wherein the baffle plate contains a plurality of holes.

71. (Currently Amended) An article comprising:

an engine comprising an exhaust port;

an exhaust system connected to the exhaust port, wherein the exhaust system comprises:

a metal substrate, having a substrate surface comprising at least one metal oxide selected from the group consisting of alumina and rare earth metal oxides;

a catalyst comprising at least one catalyst layer having an outer catalyst layer surface, the catalyst layer supported on the substrate surface; the catalyst comprising at least one catalytically active particulate material and the outer catalyst layer surface comprises agglomerates of the catalytically active particulate material having an average diameter of from about 20 to about 200 micrometers, and wherein the agglomerates at the outer catalyst layer surface adhere to each other to form peaks from about 20 to about 500 micrometers formed by depositing of at least two strata of the catalytically active particulate material with each strata being up to 20 micrometers in thickness.

72. - 74. (Cancelled)

75. (Previously Presented) The article as recited in claim 71 wherein the metal substrate is in the form of at least one plate in an exhaust system muffler.

76. (Original) The metal substrate as recited in claim 75 wherein the exhaust system is configured to direct an exhaust stream to impact with a normal vector component the exhaust baffle plate.

77. (Previously Presented) The metal substrate as recited in claim 71 wherein the article of manufacture is selected from the group consisting of a chain saw, a lawn mower, a motor cycle, a generator, a leaf blower, a string mower and a outboard motor boat motor.